

YOLO BYPASS

Conservation Opportunity Region Overview

Regional Setting

Constructed about 100 years ago to divert floodwaters on the Sacramento River, the 59,000-acre Yolo Bypass landscape is primarily a flood management area, reducing the risk of flooding in the Sacramento region through a system of weirs (Figures 1 & 2). These weirs connect the Yolo Bypass to the Sacramento River to the north (Fremont Weir, Figures 1 & 3) and to the east (Sacramento Weir), with additional inflows from various local creek bypass waters. The bypass ultimately drains into the Cache Slough Complex and Sacramento-San Joaquin River Delta to the south. Fremont Weir overtopped in approximately 70 percent of flood seasons between 1934/35 and 2011/12, augmenting flows from western tributaries.¹

The Yolo Bypass includes private duck clubs and extensive public lands, with wetlands that are managed for migratory waterfowl habitat, public education, and recreation, such as bird watching and duck hunting. Outside of the flood season, the Yolo Bypass is managed as valuable agricultural land for growing rice, tomatoes, and other prized crops for local, national, and international markets. In addition to these existing land uses, the Yolo Bypass is considered a promising zone for large-scale floodplain habitat restoration,² one of several strategies essential to recovering the Central Valley's native fisheries³ and related fishing industry. The northern extent of the Yolo Bypass (north of Interstate 80) is owned by a few private landowners, and also includes the Fremont Weir and Sacramento Weir public wildlife areas. The southern Yolo Bypass (south of Interstate 80) consists of a mosaic of private and public ownership, including the Yolo Bypass Wildlife Area. While the entire bypass functions as one contiguous floodplain when inundated, there are differences in land use and management between the northern and southern parts of the Yolo Bypass outside the flood season, and all landowners should be considered in large-scale conservation planning going forward.



Figure 1: Sacramento River spilling over Fremont Weir at north end of Yolo Bypass in 2016



Figure 2. Yolo Bypass - aerial view of flooding.

43 Planning History

44 The Yolo Bypass is at the intersection
45 of many public and private interests,
46 and has been the focus of public
47 agency planning efforts over the past
48 two decades.^{4,3,5} The Yolo Bypass
49 provides a unique opportunity to
50 demonstrate that numerous interests
51 within a landscape need not be
52 fundamentally at odds with each
53 other. It is emerging as a test case for
54 effectively managing a variety of land
55 uses in combination, such as flood
56 protection, agriculture, recreation,
57 education, and habitat for fish,
58 migratory birds,⁶ and other wildlife. In
59 recent years, a steady progression of
60 thinking and policies regarding the Yolo Bypass acknowledge that integrated management of the area for multiple
61 benefits is possible, widely desirable, and increasingly necessary.

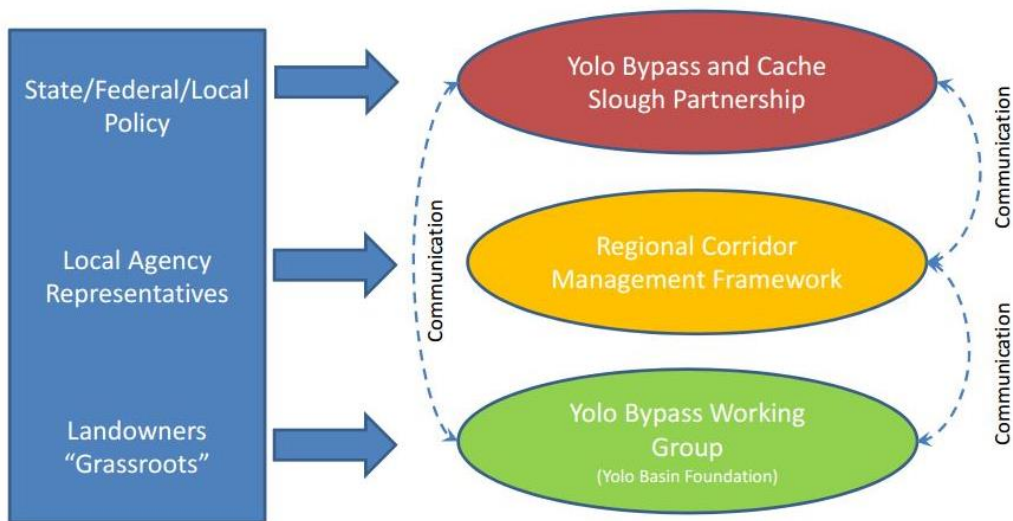


Figure 3: View south from Fremont Weir toward flooded Yolo Bypass - Dec 2016

62 There are three primary planning and communication partnerships in the Yolo Bypass, which provide places to
63 discuss and vet implementation of state and federally lead initiatives within the bypass in the context of local land
64 uses (Figure 4).

- 65 • The *Yolo Bypass and Cache Slough Partnership* (BCSP) has focused on flood risk reduction, ecosystem
66 restoration, and local sustainability, to provide a framework and arena for dialogue for the planning and
67 management of the Yolo Bypass. Made up of 15 local, state, and federal agencies, the BCSP’s purpose is
68 to improve executive-level interagency coordination. The policy-level partnership was formed via a 2016
69 Memorandum of Understanding⁷ that emphasizes the importance of achieving cross-the-board
70 improvements in habitat, flood protection, agricultural sustainability, recreation, and other public values.
71 This foundational acknowledgement and high-level support has set the stage for developing trust among
72 stakeholders, a key ingredient in successful efforts of this scale.
- 73 • The long-standing *Yolo Bypass Working Group* (YBWG), coordinated by the Yolo Basin Foundation, is one
74 example of a local landowner “grassroots” effort. Established in 1998, the YBWG includes 40 regular
75 attendees representing a wide range of stakeholders interested in managing the multiple uses of the Yolo
76 Bypass as a flood bypass, agricultural fields, recreational area, and floodplain supporting juvenile Chinook
77 salmon (*Oncorhynchus tshawytscha*), migratory birds, and other wildlife (Yolo Basin Foundation 2017).
78 Ensuring the sustained cross-communication among these varied partnerships is a critical element for
79 effective management of the Yolo Bypass for achieving multiple benefits (also see discussion in Section II).
- 80 • *Regional Corridor Management Framework* (CMF) is a coalition of local reclamation districts, counties,
81 and flood control agencies that developed the CMF as a vision for the integration of local, state, and
82 federal interests in the region (including the Cache Slough Complex).⁸ Established in 2015, the CMF
83 continues to guide local agency participation in the BCSP and other forums.

Existing Yolo Bypass Partnership Structure



84

85 **Figure 4: Existing Yolo Bypass Partnership Structure**

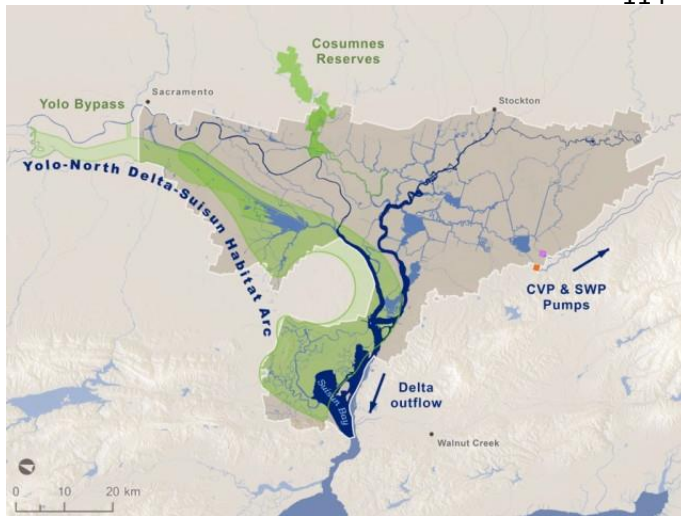
86 Current state and federally led planning efforts focused on the Yolo Bypass include:

- 87
- 88 • *California EcoRestore*. The Department of Water Resources (DWR) and the U.S. Bureau of Reclamation are pursuing the enhancement of up to 17,000 acres of floodplain habitat and restoration of 8,000 acres of tidal habitat in the Yolo Bypass and Suisun Marsh as part of California *EcoRestore*, consistent with a 2009 National Marine Fisheries Service Biological Opinion⁵. California *EcoRestore* is focused on benefitting native fish species through provision of increased juvenile rearing habitat, enhanced adult fish passage, and improvement of primary production. This includes priority projects like the realignment of Lower Putah Creek. It is consistent with the goals of the 2012 *Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan*. Financing for these projects is provided from state and federal water contractors.
 - 96 • *Central Valley Flood Protection Plan (CVFPP)*. The 2016 CVFPP Conservation Strategy⁹ includes the continuation of the Floodplain Restoration Opportunity Analysis. This analysis offers decision diagrams to identify and prioritize potential locations within the System-wide Planning Area for implementing two types of management actions and their combination: 1) modification of floodplain topography (specifically, lowering floodplain topography through targeted excavation); and 2) levee relocation (specifically, constructing setback levees). Yolo Bypass levee setbacks and weir extensions are central to the state strategy for increasing flood system resiliency.
 - 103 • *Sacramento River General Reevaluation Report (GRR)*. Working in partnership with DWR, the U.S. Army Corps of Engineers is developing the Sacramento River GRR, a planning vehicle to secure congressional approval for significant improvements to the Yolo Bypass and Sacramento River.
- 105

106 Opportunities for Conservation

107 The Yolo Bypass offers notable conservation value for wildlife species associated with floodplains, tidal wetlands, and riparian zones.⁴ This includes resident and anadromous fish native to the Delta, such as spring-run and fall-run Chinook salmon, green sturgeon (*Acipenser medirostris*), white sturgeon (*A. transmontanus*), and Sacramento splittail (*Pogonichthys macrolepidotus*). Other native wildlife species which utilize the Yolo Bypass habitats include Swainson's hawk (*Buteo swainsoni*), giant garter snake (*Thamnophis gigas*), and tricolored blackbird (*Agelaius*

112 *tricolor*). There are several existing conservation easements and three wildlife areas owned by California
113 Department of Fish and Wildlife in place within the Yolo Bypass that protect habitat for these wildlife species.



114 Figure 5: The Delta, showing the North Delta Habitat Arc.
Source: [UC Davis Center for Watershed Sciences](#)

The UC Davis Center for Watershed Sciences has identified Yolo Bypass as a primary component of the “North Delta Habitat Arc” (Figure 5). It consists of a reconciled ecosystem strategy to create an arc of habitats connected by the flows of the Sacramento River.¹⁰ The Yolo Bypass is the upstream end of the arc, which continues through the Cache-Lindsey Slough-Liberty Island region, down the Sacramento River including Twitchell and Sherman Islands, and into Suisun Marsh.

There are also opportunities for collaborative habitat restoration planning in the bypass, through the development and implementation of Habitat Conservation Plans (HCPs) and HCP/Natural Community Conservation Plans (NCCPs), including the Yolo County Natural Heritage Program HCP/NCCP, the South Sacramento HCP, and California *EcoRestore*.

133 Potential Solutions to Recognized Challenges

134 Land ownership and land uses within the Yolo Bypass are varied and should be taken into account when planning
135 and implementing conservation projects. Public access in the Yolo Bypass is available at the Fremont Weir Wildlife
136 Area for hunting, and the Yolo Bypass Wildlife Areas is managed for hunting, wildlife viewing, and environmental
137 education, as well as agricultural activities. Parcels in the
138 northern Bypass (north of highway 80, Figure 6) are
139 owned by four private landowners and the state
140 (Fremont Weir Wildlife Area), whereas a large portion of
141 the southern part (south of highway 80) is state-owned
142 (Yolo Bypass Wildlife Area, Figure 7) and includes a lot of
143 smaller parcels and landowners. In the north, land uses
144 are focused on fisheries management, larger scale
145 agriculture, and some waterfowl hunting. While
146 modifications to Fremont Weir potentially impact the
147 entire Yolo Bypass, additional fisheries habitat projects in
148 the north are being implemented by the Fish Restoration
149 Program and California *EcoRestore* to improve juvenile
150 fish passage and floodplain rearing habitat. In the south,
151 land uses are more varied among a diverse group of
152 stakeholders and include hunting, recreation, and smaller
153 agricultural operations. Yet, in any Yolo Bypass planning effort, both subregions need to be considered because
154 they are connected within one contiguous floodway.



Figure 6: Highway 80 crossing Yolo Bypass looking north

155 In the Yolo Bypass, floodplain-related conservation goals to provide extended inundation to promote juvenile
156 salmonid rearing habitat,¹¹ or tidal restoration related goals to improve the Delta food web, have the potential to
157 conflict with existing agricultural land uses and improved recreation and public access, particularly for hunting,
158 nature viewing, and education. Increased tidal restoration in the southern Bypass may also create the need for
159 mosquito control and the potential for mercury contamination.

Sustainable Solutions Needed in Yolo Bypass

How to best:

- Balance flood protection and conservation on private/agricultural lands;
- Restore fish habitat (e.g., fish passage, floodplain rearing, recovery projects);
- Consider economic interests;
- Manage public access, especially in light of potential nuisance (e.g., trash, law enforcement);
- Manage flood operations and floodplain enhancement on agricultural lands in light of altered practices (e.g., fish screening of agricultural water intakes) and schedules to benefit fish and wildlife.
- Manage hedgerows and other transition zones such as levees and related regulatory challenges;
- Assure best management practices to address concerns around mosquito control, regulatory thresholds for water quality (e.g., Total Maximum Daily Loads for mercury in the context of flooding rice fields);
- Provide additional winter flooding for floodplain salmon rearing benefits;
- Address the need to monitor and inventory water quality impacts and impacts to fisheries;
- Strategically connect existing conservation areas with other opportunities;
- Provide collective multi-benefit solutions and funding that helps resolve issues;
- Facilitate the permitting process as discussed in Section V;
- Manage agricultural water intakes to minimize fish entrainment and related loss that may be of concern;
- Consider short-term impacts (e.g., from construction) versus potential impacts or perhaps evolving benefits throughout the process of planning, implementation, and adaptive management.

160 Wildlife-friendly Agriculture

161 Wildlife-friendly farming integrates conservation goals with agriculture to benefit wildlife and conserve biodiversity
162 on land that is used to produce agricultural commodities. Wildlife-friendly agricultural practices in the Yolo Bypass
163 include farming crops that benefit wildlife (such as rice, safflower, tomatoes, corn, sunflower, and irrigated
164 pasture) and providing drainage ditches and hedgerows with habitat value. In the Yolo Bypass, like elsewhere in
165 the Delta, agriculture has been the main way of life, industry, and cultural linkage to the land for several
166 generations. As a result of these strong cultural ties to the land, landowners are concerned about the potential to
167 lose their livelihood and lifestyle if habitat restoration displaces agriculture. As conservation projects are
168 implemented and managed over the long term in the Yolo Bypass, it is essential to have clear and consistent
169 communication among all stakeholders (landowners, agencies, and nongovernmental organizations) and
170 implement consideration of good neighbor practices such as those outlined by the Agricultural Lands Stewardship
171 Working Group.¹² Prior Delta planning efforts have shown that early and broad inclusion of stakeholders in the

172 planning process is essential to the success of
173 conservation, and local community concerns will have
174 to be considered carefully to ensure long-term viability
175 of conservation in this region.

176 *Integrated Flood Management*

177 The Yolo Bypass is an integral part of the regional
178 integrated flood management system, and it serves as
179 the primary flood bypass management area to reduce
180 Sacramento region risk of flooding through a system of
181 weirs. Flood protection for the agricultural operations
182 in the region is provided by levees and the
183 Reclamation Districts that maintain them. It is possible
184 to link long-term levee maintenance and agricultural



Figure 7: Yolo Bypass Wildlife Area

185 operations with conservation outcomes.⁹ For example,
186 maintaining hedgerows at the margins of agricultural
187 fields can increase the habitat value of agricultural operations, and levees could be used to provide wildlife
188 transition habitat. These potential links between flood control and conservation provide opportunities for
189 integrative and strategic conservation that connects directly with local stakeholder needs. The specific actions
190 identified in the CVFPP Conservation Strategy for the Yolo Bypass are consistent with the goals and objectives of
191 California *EcoRestore* and the Sacramento River GRR.

192 *Low-Impact Recreation*

193 There are several recreation areas within the Yolo Bypass: The Yolo Bypass Wildlife Area (YBWA), and Fremont
194 Weir and Sacramento Weir Wildlife Areas. These are state-run facilities established and managed for hunting
195 waterfowl and other game birds, public access for wildlife viewing, and education opportunities. The California
196 State Parks Recreation Proposal for the Sacramento-San Joaquin Delta¹³ recognizes potential additional
197 opportunities in this area for ecosystem restoration coupled with outdoor recreation (wildlife observation,
198 boating, fishing access, and hunting), particularly in the southern end of the Yolo Bypass near Liberty Island
199 (Figures 8 & 9). The integration of floodplain conservation activities with current educational/recreational uses of
200 the Yolo Bypass may provide additional opportunities. This could include the direct exploration of fishery issues as
201 an expanded focus of YBWA education programs, for example. However, providing public access to restoration
202 sites remains a general challenge in the Delta because of the need to minimize human disturbance to wildlife and
203 habitat impacts as a result of littering.

204 *Climate Change and Adaptation Opportunities for Long-term Sustainability*

205 The Yolo Bypass region will be affected by climate change induced sea level rise within the next 30-100 years.

206 Lands currently in the intertidal zones
207 are projected to become subtidal.¹⁴

208 Rising water levels will alter and
209 submerge current shorelines and
210 nearby areas. In some areas, sea level
211 rise will mean that current agricultural
212 land will be lost to increased salinity
213 levels or inundation. Further, flood
214 dynamics will likely change over the
215 coming decades, with more frequent
216 and extreme storm and rainfall events
217 and associated flood pulses. Scenario
218 planning will help evaluate forecasted



Figure 8: Northern end of Liberty Island across shipping channel

219 impacts on ecosystems and species and
220 will integrate these into the long-term

221 conservation and infrastructure planning and management picture. A scenario planning approach will also
222 integrate long-term conservation management and funding needs, and it will allow stakeholders to evaluate how
223 near-term conservation actions may evolve into the future. This will help prioritize conservation actions based on
224 long-term effectiveness, the potential for outcomes to evolve over time, and cost effectiveness. Regular
225 reevaluation of scenarios over time will allow land managers and planners to reexamine how earlier projections
226 played out and adjust conservation land management over time.

227 **Entities/Partnerships Important for Implementation (Now and Ongoing)**

228 The cornerstones for successful conservation planning and implementation in the Delta are: 1) establishing and
229 maintaining trust among stakeholders through continuous communication and evaluation of goal-based progress;
230 2) an agreed-upon structure for roles and responsibilities to govern an implementation partnership; and 3)
231 science-based decision support. Several partnership efforts have focused on conservation and floodplain
232 management issues in the Yolo Bypass-Cache Slough Complex. At the state agency level, the Yolo Bypass and
233 Cache Slough Partnership enables high-level collaboration among agencies and stakeholders. The CMF allows local
234 and regional agencies to effectively engage in the Yolo Bypass partnership efforts and decision-making. As a long-
235 standing stakeholder partnership, the YBWG has integrated local, mostly agricultural, stakeholders in the southern
236 Yolo Bypass region into conservation planning efforts. With sufficient early and consistent communication,
237 coordination, and an effective governance structure, these three efforts could serve as an ongoing forum for
238 successful long-term conservation planning and management in the Yolo Bypass-Cache Slough region.

239 **Link to Delta Conservation Framework**

240 The Delta Conservation Framework is a high-level conservation planning framework to 2050 with a landscape-scale
241 focus across the entire Delta, Suisun Marsh, and Yolo Bypass. It provides overarching goals and landscape-scale
242 strategies with targeted objectives that could be integrated at the finer scale by regional conservation planning
243 partnerships that develop *Regional Conservation Strategies*. Together, the existing partnerships in the
244 Yolo Bypass could lead to the development of a long-
245 term Yolo Bypass *Regional Conservation Strategy*
246 (RCS). This would afford landscape-scale integration
247 of the existing Yolo Bypass plans, tying them in with
248 the Delta Conservation Framework's landscape scale
249 goals and strategies.
250

251 A Yolo Bypass RCS could utilize scenario planning to
252 develop strategies to assure flood protection,
253 improve ecological function, assist species recovery,
254 integrate benefits for wildlife-friendly farming
255 operations, and provide recreation at the local and
256 landscape scales. Regular communication and
257 coordination between the BCSP, CMF, and YBWG as

258 part of a Yolo Bypass RCS effort would help balance the interests of each group, consistent with Delta Conservation
259 Framework Goal A, Strategies A1 and A2. A RCS could also focus on developing multi-benefit conservation
260 solutions through actions that help reestablish ecological function, assist species recovery, and integrate benefits
261 for flood protection, wildlife-friendly farming operations, and recreation at the local and landscape scales (as part
262 of "North Delta Arc" dynamics; Goals C-E). A combined Yolo Bypass RCS could also present a unique opportunity to
263 align with Goals F and G, aimed at addressing conservation-related permitting through a general regional permit
264 approach, and developing short- and long-term funding via bond initiatives and other opportunities. In particular, a
265 facilitated process for Yolo Bypass conservation-related permitting would increase the efficiency of project
266 implementation and continued management and would help balance considerations of short-term or construction-
267 related impacts (in the case of infrastructure projects) with potential long-term impacts and benefits of specific
268 projects.



Figure 9: Northern end of Liberty Island

- ¹ DWR (2012). Fact Sheet, Sacramento River Flood Protection System Weirs and Flood Relief Structures. State of California, Department of Water Resources, Hydrology and Flood Operations Office (DWR). Available: http://www.water.ca.gov/floodmgmt/docs/sacramento_river_system_weirs.pdf. Accessed: July 2017.
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- ³ Reclamation and DWR (2012). Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan. Long-Term Operation of the Central Valley Project and State Water Project Biological Opinion - Reasonable and Prudent Alternative Actions I.6.1 and I.7. U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR), Sacramento, CA. Available: <http://www.water.ca.gov/fishpassage/docs/yolo2.pdf> Accessed: May 2017.
- ⁴ BDCP (2013). Bay Delta Conservation Plan Public Draft (BDCP). Available: <http://baydeltaconservationplan.com/EnvironmentalReview/EnvironmentalReview/2013-2014PublicReview/2013PublicReviewDraftBDCP.aspx>. Accessed: June 2016.
- ⁵ NMFS (2009). Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. National Marine Fisheries Service (NMFS) - Southwest Region. Available: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=21473>. Accessed: May 2017.
- ⁶ Ducks Unlimited (2012). Waterfowl Impacts of the Proposed Conservation Measure 2 for the Yolo Bypass – An effects analysis tool. Ducks Unlimited, Rancho Cordova, CA. Available: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKewio8qKKnPPUAhVCsVQKHafRAsoQFggqMAE&url=http%3A%2F%2Fbaydeltaconservationplan.com%2FLibraries%2FDynamic_Document_Library%2FYBFE_Planning_Team_-_Waterfowl_Impacts_of_the_Proposed_CM_2_Report-_7-16-12.sflb.ashx&usq=AFQjCNFXCJaUYwuQLCGDT_bHH0UGaUB1rw&cad=rja. Accessed: May 2017.
- ⁷ Natural Resources Agency (2016). Yolo Bypass & Cache Slough Memorandum of Understanding. California Natural Resources Agency, Sacramento, CA. Available: http://resources.ca.gov/docs/160510-Memorandum_of_Understanding.pdf. Accessed: May 2017.
- ⁸ Yolo County (2015). Lower Sacramento/Delta North Region Corridor Management Framework. Yolo County Water Resources Association, Woodland, CA. Available: http://www.yolowra.org/board_agendas/2015/CMF-LS-ND.pdf. Accessed: June 2017.
- ⁹ DWR (2016). Central Valley Flood Protection Plan Conservation Strategy. California Department of Water Resources (DWR), Sacramento, CA. Available: http://www.water.ca.gov/conservationstrategy/docs/cs_draft.pdf. Accessed January 25, 2017.
- ¹⁰ Moyle, Peter, J. Durand, and A. Manfree. (2016). The North Delta Habitat Arc: an Ecosystem Strategy for Saving Fish. California Water Blog. UC Davis Center for Watershed Sciences, November 6, 2016.
- ¹¹ Jeffres, C. A., J. J. Opperman, and P. B. Moyle (2008). Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river. *Environ Biol Fish* 83:449–458
- ¹² DWR (2017). DWR Agricultural Lands Stewardship Workgroup - potential strategies. California Department of Water Resources, Agricultural Lands Stewardship Workgroup (DWR), Sacramento, CA. Available: <https://agriculturallandstewardship.water.ca.gov/web/guest/strategy-a4.1>. Accessed: January 27, 2017.
- ¹³ California State Parks (2011). Recreation Proposal for the Sacramento-San Joaquin Delta. California Department of Parks and Recreation (State Parks), Sacramento, CA. Available: http://www.parks.ca.gov/pages/795/files/delta%20rec%20proposal_08_02_11.pdf Accessed: Jan 22, 2017.
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